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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/541,222	07/01/2005	Soichiro Kawakami	03500.000345.	4982

5514 7590 02/15/2011

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EXAMINER	
HAN, KWANG S	
ART UNIT	PAPER NUMBER
1727	
MAIL DATE	DELIVERY MODE
02/15/2011	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/541,222	KAWAKAMI ET AL.	
	Examiner	Art Unit	
	Kwang Han	1727	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 September 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,5,7-9,11-13 and 15-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,5,7-9,11-13 and 15-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

ELECTRODE MATERIAL FOR LITHIUM SECONDARY BATTERY AND ELECTRODE STRUCTURE HAVING THE ELECTRODE MATERIAL

Examiner: K. Han SN: 10/541,222 Art Unit: 1727 February 13, 2011

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on September 3, 2010 has been entered. Claims 1, 5, 7, 9, 13, 15, and 20 were amended.

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 1, 5, 7-9, 11-13 and 15-22 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claims 1 recites "half

value width for the diffraction intensity at 2θ of the main peak of the X-ray diffraction chart of the particles of the solid state alloy is 1.0°or more" which does not have support within the specifications. Page 18 of the applications specification shows a preferable value of 0.1°or more, and a more preferably 0.2° or more. All claims dependant on claim 1 are also rejected for the same.

Claim Rejections - 35 USC § 103

5. The claim rejection under 35 U.S.C. 103(a) as unpatentable over Idota et al. in view of Suzuki et al., Kasashima et al., and Nakanishi et al. on claims 1, 5, 7-9, 11-13, and 15-22 is withdrawn, because independent claim 1 has been amended.

6. Claims 1, 5, 7, 8, 13, 15-18, and 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Idota et al. (US 6235427) in view of Kasashima et al. (US 6322926).

Regarding claim 1, Idota is directed towards an electrode material for a lithium secondary battery comprised of particles of a solid state silicon alloy in a preferable particle size range of 0.005 to 0.5 microns (2:26-32; 5:34-39), having an amorphous material (2:13-25) including alkaline earth metals, transitions metals, or semi-metals (1:47-60; 3:4-20) composed of silicon and two or more elements including tin, gallium, aluminum, silver, zinc, and titanium (3:16-27), a ratio of the alloying metals other than silicon to be between 5 to 2000% by weight (3:21-27), where the solid state alloy is a solid solution (3:9-10) with the alloy undergoing reactions on cooling (3:12-14), and an adhesion of a oxide to the surface of the silicon alloy (film surface, 5:1-23) in a mixing

ratio of 2 to 50% by weight based on the silicon alloy (5:31-34). The alloy would inherently be mixed in a melted liquid state (single liquid phase) before the cooling occurs. A reference which is silent about a claimed invention's features is inherently anticipatory if the missing feature *is necessarily present in that which is described in the reference*. In re Robertson, 49 USPQ2d 1949 (1999). It has also been held that where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); In re Woodruff, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990) (MPEP 2144.05) Idota is silent towards the oxide film having a thickness in the range of 2 to 10 nm and the half value width for the diffraction intensity of the solid state alloy.

While the prior art does not explicitly teach the half value width for the diffraction intensity of the solid state alloy, these properties are considered inherent in the prior art barring any differences shown by objective evidence between (the object) the solid state silicon alloy disclosed in the prior art and the applicant. As (the object) the solid state alloy taught by the prior art and the applicant are identical within the scope of claim 1, Idota inherently teaches that the half value width for the diffraction intensities are the same. The courts have held that claiming of a property or characteristic which is inherently present in the prior art does not necessarily make the claim patentable. In re Best, 562 F.2d 1252, 1254, 195 USPQ 430, 433 (CCPA 1977). See MPEP 2112 and 2112.01. When the Examiner has provided a sound bases for believing that the products of the applicant and the prior art are the same, the burden of proof is shifted to the applicant to prove that the product shown in the prior art does not possess the

characteristics of the claimed product. In re Spada, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990).

Kasashima teaches a powder material for a battery which is subjected to a dry surface treatment on the alloy material to form a very thin oxide film by exposing the alloy powder to a heat treatment in an inert atmosphere containing a slight amount of an oxygen source to impart corrosion resistance (6:3-12). It would have been obvious to one of ordinary skill in the art at the time of the invention to subject the silicon alloy of Idota to a surface treatment to apply a thin oxide film of a few nanometers on the alloy material of Idota because Kasashima teaches an oxide film on the alloy particles allows for increased corrosion resistance. The instant application forms the oxide film using the same method (Pg. 33 of specifications) as outlined by Kasashima.

Regarding claim 5, Idota discloses an alloy composed of silicon and two or more elements including tin, gallium, aluminum, silver, zinc, and titanium (3:16-27).

Regarding claims 7 and 8, Idota discloses the alloy containing a eutectic including eutectics formed from silicon and an element selected from tin, gallium, aluminum, silver, zinc, and titanium (3:4-27).

Regarding claim 13, Idota discloses particles of the silicon alloy having a preferable average particle diameter range of 0.001 to 5 μm.

Regarding claims 15 and 17, Idota discloses the material for the electrode comprised of a mixture of silicon alloy and a carbonaceous material which is employed as a conducting agent (7:49-53).

Regarding claim 16, Idota discloses an electrode structure which includes a conductive agent, a binder, and a current collector (2:3-13).

Regarding claim 18, Idota discloses a positive electrode active material capable of intercalating and deintercalating lithium and the negative electrode material capable of intercalating and deintercalating lithium (1:50-60).

Regarding claim 20, Idota is directed towards an electrode material for a lithium secondary battery comprised of particles of a solid state silicon alloy having an amorphous material (2:13-25; 5:34-39) including alkaline earth metals, transitions metals, or semi-metals (1:47-60; 3:4-20) composed of silicon and two or more elements including tin, gallium, aluminum, silver, zinc, titanium (3:16-27), and more specifically a Si-Ag-Sn alloy (29:41-54) and Si-Ag-Sn alloy (23:46-24:10), a ratio of the alloying metals other than silicon to be between 5 to 2000% by weight (3:21-27), where the solid state alloy is a solid solution (3:9-10) with the alloy undergoing reactions on cooling (3:12-14), and an adhesion of a oxide material including Al_2O_3 and TiO_2 to the surface of the silicon alloy (film surface, 5:1-23). The alloy would inherently be mixed in a melted liquid state (single liquid phase) before the cooling occurs. A reference which is silent about a claimed invention's features is inherently anticipatory if the missing feature *is necessarily present in that which is described in the reference*. In re Robertson, 49 USPQ2d 1949 (1999). Idota further discloses the composition of the alloy affects the electrical conductivity, discharge capacity, high rate characteristics, and cycle life (3:21-34) teaching the composition as a result effective variable. It would have been obvious to one of ordinary skill in the art at the time of the invention to vary the

ratio of the elements in the alloy since it has been held that discovering the optimum range for a result effective variable such as composition involves only routine skill in the art in the absence of showing of criticality in the claimed range (MPEP 2144.05) In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). Idota is silent towards the oxide film having a thickness in the range of 2 to 10 nm and the half value width for the diffraction intensity of the solid state alloy.

While the prior art does not explicitly teach the half value width for the diffraction intensity of the solid state alloy, these properties are considered inherent in the prior art barring any differences shown by objective evidence between (the object) the solid state silicon alloy disclosed in the prior art and the applicant. As (the object) the solid state alloy taught by the prior art and the applicant are identical within the scope of claim 1, Idota inherently teaches that the half value width for the diffraction intensities are the same. The courts have held that claiming of a property or characteristic which is inherently present in the prior art does not necessarily make the claim patentable. In re Best, 562 F.2d 1252, 1254, 195 USPQ 430, 433 (CCPA 1977). See MPEP 2112 and 2112.01. When the Examiner has provided a sound bases for believing that the products of the applicant and the prior art are the same, the burden of proof is shifted to the applicant to prove that the product shown in the prior art does not possess the characteristics of the claimed product. In re Spada, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990).

Kasashima teaches a powder material for a battery which is subjected to a dry surface treatment on the alloy material to form a very thin oxide film by exposing the

alloy powder to a heat treatment in an inert atmosphere containing a slight amount of an oxygen source to impart corrosion resistance (6:3-12). It would have been obvious to one of ordinary skill in the art at the time of the invention to subject the silicon alloy of Idota to a surface treatment to apply a thin oxide film of a few nanometers on the alloy material of Idota because Kasashima teaches an oxide film on the alloy particles allows for increased corrosion resistance. The instant application forms the oxide film using the same method (Pg. 33 of specifications) as outlined by Kasashima.

Regarding claim 21, Idota discloses an electrode structure which includes a conductive agent, a binder, and a current collector (2:3-13).

Regarding claim 22, Idota discloses a positive electrode active material capable of intercalating and deintercalating lithium and the negative electrode material capable of intercalating and deintercalating lithium (1:50-60). A reference which is silent about a claimed invention's features is inherently anticipatory if the missing feature *is necessarily present in that which is described in the reference*. In re Robertson, 49 USPQ2d 1949 (1999).

7. Claims 9, 11, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Idota et al. and Kasashima et al. as applied to claim 1 above, and further in view of Suzuki et al. (US 2002/0146623).

Regarding claims 9, 11, and 12, the teachings of Idota as discussed above are herein incorporated. Idota is silent as to the electrode material being doped with boron.

Suzuki teaches a lithium secondary battery with a silicon material electrode which contains doped boron [0069] in the amount of 0.1 to 50 wt. % (0.1 wt% silicon would have an atomic ratio of approximately 0.0026 relative to silicon) for the benefit of providing improved capacity loss and fine cycle properties while retaining a large discharge capacity [0015, 0016]. It would have been obvious to one of ordinary skill in the art at the time of the invention to use a silicon based electrode which contains doped boron for lithium secondary material because Suzuki teaches it provides for improved capacity loss and fine cycle properties while retaining a large discharge capacity.

8. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Idota et al. and Kasashima et al. as applied to claim 18 above and further in view of Nakanishi et al. (WO 2001/41249 using US 6723472 for translation and citation).

Regarding claim 19, the teachings of Idota and Kasashima as discussed above are herein incorporated. Idota discloses the positive electrode being a lithium-transition metal complex oxide (Abstract) but is silent towards this material comprising yttrium or yttrium and zirconium.

Nakanishi teaches a lithium secondary battery which positive electrode materials containing elements from Groups IIIB and IVB of the periodic table (i.e. yttrium, zirconium) for the benefit of forming a battery with high rate and low-temperature characteristics because addition of these elements causes change in the surface state of the active material to increase the surface area (1:50-59; 5:10-25). It would have

been obvious to one of ordinary skill in the art at the time of the invention to use elements including yttrium and zirconium in the positive electrode because Nakanishi teaches it provides positive electrodes for batteries having high-rate and low-temperature characteristics.

9. Claims 1, 5, 7, 8, 13, 15-18, and 20-22 are also rejected under 35 U.S.C. 103(a) as being unpatentable over Idota et al. (US 6235427) in view of Kosuzu et al. (US 2003/0157407).

Regarding claim 1, Idota is directed towards an electrode material for a lithium secondary battery comprised of particles of a solid state silicon alloy in a preferable particle size range of 0.005 to 0.5 microns (2:26-32; 5:34-39), having an amorphous material (2:13-25) including alkaline earth metals, transitions metals, or semi-metals (1:47-60; 3:4-20) composed of silicon and two or more elements including tin, gallium, aluminum, silver, zinc, and titanium (3:16-27), a ratio of the alloying metals other than silicon to be between 5 to 2000% by weight (3:21-27), where the solid state alloy is a solid solution (3:9-10) with the alloy undergoing reactions on cooling (3:12-14), and an adhesion of a oxide to the surface of the silicon alloy (film surface, 5:1-23) in a mixing ratio of 2 to 50% by weight based on the silicon alloy (5:31-34). The alloy would inherently be mixed in a melted liquid state (single liquid phase) before the cooling occurs. A reference which is silent about a claimed invention's features is inherently anticipatory if the missing feature *is necessarily present in that which is described in the reference*. In re Robertson, 49 USPQ2d 1949 (1999). It has also been held that where

the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); In re Woodruff, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990) (MPEP 2144.05). Idota is silent towards the oxide film having a thickness in the range of 2 to 10 nm and the half value width for the diffraction intensity of the solid state alloy.

While the prior art does not explicitly teach the half value width for the diffraction intensity of the solid state alloy, these properties are considered inherent in the prior art barring any differences shown by objective evidence between (the object) the solid state silicon alloy disclosed in the prior art and the applicant. As (the object) the solid state alloy taught by the prior art and the applicant are identical within the scope of claim 1, Idota inherently teaches that the half value width for the diffraction intensities are the same. The courts have held that claiming of a property or characteristic which is inherently present in the prior art does not necessarily make the claim patentable. In re Best, 562 F.2d 1252, 1254, 195 USPQ 430, 433 (CCPA 1977). See MPEP 2112 and 2112.01. When the Examiner has provided a sound bases for believing that the products of the applicant and the prior art are the same, the burden of proof is shifted to the applicant to prove that the product shown in the prior art does not possess the characteristics of the claimed product. In re Spada, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990).

Kosuzu teaches an electrode material for a rechargeable lithium battery comprising a fine powder [Abstract] that has an oxygen content falling in a range of 0.5-5 wt% so that the initial insertion and release coulombic efficiency of the lithium is

maintained at a high level [0053] and the formation of thin oxide film with a thickness between 0.8 to 100 nm to stabilize the silicon based fine powder and prevent the fine powder from being oxidized [0158-0161]. It would have been obvious to one of ordinary skill in the art at the time of the invention to have the silicon powder oxygen content of Idota to fall within a range of 0.5-5 wt% and have the formation of a thin oxide film with a thickness between 0.8 to 100 nm because Kosuzo teaches this allows for the insertion and release coulombic efficiency of the lithium to be maintained at a high level and the prevention of the powder from being oxidized.

Regarding claim 5, Idota discloses an alloy composed of silicon and two or more elements including tin, gallium, aluminum, silver, zinc, and titanium (3:16-27).

Regarding claims 7 and 8, Idota discloses the alloy containing a eutectic including eutectics formed from silicon and an element selected from tin, gallium, aluminum, silver, zinc, and titanium (3:4-27).

Regarding claim 13, Idota discloses particles of the silicon alloy having a preferable average particle diameter range of 0.001 to 5 μm.

Regarding claims 15 and 17, Idota discloses the material for the electrode comprised of a mixture of silicon alloy and a carbonaceous material which is employed as a conducting agent (7:49-53).

Regarding claim 16, Idota discloses an electrode structure which includes a conductive agent, a binder, and a current collector (2:3-13).

Regarding claim 18, Idota discloses a positive electrode active material capable of intercalating and deintercalating lithium and the negative electrode material capable of intercalating and deintercalating lithium (1:50-60).

Regarding claim 20, Idota is directed towards an electrode material for a lithium secondary battery comprised of particles of a solid state silicon alloy having an amorphous material (2:13-25; 5:34-39) including alkaline earth metals, transitions metals, or semi-metals (1:47-60; 3:4-20) composed of silicon and two or more elements including tin, gallium, aluminum, silver, zinc, titanium (3:16-27), and more specifically a Si-Ag-Sn alloy (29:41-54) and Si-Ag-Sn alloy (23:46-24:10), a ratio of the alloying metals other than silicon to be between 5 to 2000% by weight (3:21-27), where the solid state alloy is a solid solution (3:9-10) with the alloy undergoing reactions on cooling (3:12-14), and an adhesion of a oxide material including Al_2O_3 and TiO_2 to the surface of the silicon alloy (film surface, 5:1-23). The alloy would inherently be mixed in a melted liquid state (single liquid phase) before the cooling occurs. A reference which is silent about a claimed invention's features is inherently anticipatory if the missing feature *is necessarily present in that which is described in the reference*. In re Robertson, 49 USPQ2d 1949 (1999). Idota further discloses the composition of the alloy affects the electrical conductivity, discharge capacity, high rate characteristics, and cycle life (3:21-34) teaching the composition as a result effective variable. It would have been obvious to one of ordinary skill in the art at the time of the invention to vary the ratio of the elements in the alloy since it has been held that discovering the optimum range for a result effective variable such as composition involves only routine skill in the

art in the absence of showing of criticality in the claimed range (MPEP 2144.05) In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). Idota is silent towards the oxide film having a thickness in the range of 2 to 10 nm and the half value width for the diffraction intensity of the solid state alloy.

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Kosuzu teaches an electrode material for a rechargeable lithium battery comprising a fine powder [Abstract] that has an oxygen content falling in a range of 0.5-5 wt% so that the initial insertion and release coulombic efficiency of the lithium is maintained at a high level [0053] and the formation of thin oxide film with a thickness

between 0.8 to 100 nm to stabilize the silicon based fine powder and prevent the fine powder from being oxidized [0158-0161]. It would have been obvious to one of ordinary skill in the art at the time of the invention to have the silicon powder oxygen content of Idota to fall within a range of 0.5-5 wt% and have the formation of a thin oxide film with a thickness between 0.8 to 100 nm because Kosuzo teaches this allows for the insertion and release coulombic efficiency of the lithium to be maintained at a high level and the prevention of the powder from being oxidized.

Regarding claim 21, Idota discloses an electrode structure which includes a conductive agent, a binder, and a current collector (2:3-13).

Regarding claim 22, Idota discloses a positive electrode active material capable of intercalating and deintercalating lithium and the negative electrode material capable of intercalating and deintercalating lithium (1:50-60). A reference which is silent about a claimed invention's features is inherently anticipatory if the missing feature *is necessarily present in that which is described in the reference*. In re Robertson, 49 USPQ2d 1949 (1999).

10. Claims 9, 11, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Idota et al. and Kosuzu et al. as applied to claim 1 above, and further in view of Suzuki et al. (US 2002/0146623).

Regarding claims 9, 11, and 12, the teachings of Idota and Kosuzu as discussed above are herein incorporated. Idota is silent as to the electrode material being doped with boron.

Suzuki teaches a lithium secondary battery with a silicon material electrode which contains doped boron [0069] in the amount of 0.1 to 50 wt. % (0.1 wt% silicon would have an atomic ratio of approximately 0.0026 relative to silicon) for the benefit of providing improved capacity loss and fine cycle properties while retaining a large discharge capacity [0015, 0016]. It would have been obvious to one of ordinary skill in the art at the time of the invention to use a silicon based electrode which contains doped boron for lithium secondary material because Suzuki teaches it provides for improved capacity loss and fine cycle properties while retaining a large discharge capacity.

11. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Idota et al. and Kosuzu et al. as applied to claim 18 above and further in view of Nakanishi et al. (WO 2001/41249 using US 6723472 for translation and citation).

Regarding claim 19, the teachings of Idota and Kosuzu as discussed above are herein incorporated. Idota discloses the positive electrode being a lithium-transition metal complex oxide (Abstract) but is silent towards this material comprising yttrium or yttrium and zirconium.

Nakanishi teaches a lithium secondary battery which positive electrode materials containing elements from Groups IIIB and IVB of the periodic table (i.e. yttrium, zirconium) for the benefit of forming a battery with high rate and low-temperature characteristics because addition of these elements causes change in the surface state of the active material to increase the surface area (1:50-59; 5:10-25). It would have

been obvious to one of ordinary skill in the art at the time of the invention to use elements including yttrium and zirconium in the positive electrode because Nakanishi teaches it provides positive electrodes for batteries having high-rate and low-temperature characteristics.

Response to Arguments

12. Applicant's arguments filed September 3, 2010 have been fully considered but they are not persuasive.

Applicant's principal arguments are:

(a) Idota does not disclose oxide particles that are melted to cover the particles of silicon.

In response to Applicant's arguments, please consider the following comments:

(a) As presented in the rejection above, Idota modified by the teachings of Kasashima or Kosuzu provides for a surface treatment on the alloy material to form a very thin oxide film by exposing the alloy powder to a heat treatment in an inert atmosphere containing a slight amount of an oxygen source to impart corrosion resistance which is the same method shown in the Applicants specification.

Contact/Correspondence Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kwang Han whose telephone number is (571) 270-

5264. The examiner can normally be reached on Monday through Friday 8:00am to 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dah-Wei Yuan can be reached on (571) 272-1295. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/K. H./
Examiner, Art Unit 1727

/Dah-Wei D. Yuan/
Supervisory Patent Examiner, Art Unit 1727